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HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER	
LAY, MICHELLE K	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/694,076
Filing Date: October 27, 2003
Appellant(s): HAO ET AL.

Dan C. Hu (40,025)
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 22 June 2007 appealing from the Office action mailed 23 January 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

Keim, Daniel A. et al. "Hierarchical Pixel Bar Charts" IEEE Transactions on Visualization and Computer Graphics, vol. 8, no.3 (July-Sept. 2002), pp. 255-269

Keim, Daniel A. "Designing Pixel-Oriented Visualization Techniques: Theory and Applications" IEEE Transations on Visualization and Computer Graphics, vol. 6, no. 1 (Jan.-March 2002), pp. 59-78

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims **1**, **2**, **8**, **11**, **13-15**, **18**, **20-22**, and **24** are rejected under 35 U.S.C. 102(a) as being anticipated by "Hierarchical Pixel Bar Charts" to Keim et al.

In regards to claim **1**, Keim teaches *a method for generating a pixel-oriented graph, comprising* [pg. 257 §3.1]:

a) ***determining a visual boundary for representing an aggregate of a set of values of a variable depicted in the pixel-oriented graph;***

Dividing attribute for between-bar partitioning. Dividing attribute partitions the data into disjoint groups corresponding to the bars. Dividing attribute, i.e., one for the horizontal axis (D_x) and the one for the vertical axis (D_y). The dividing

attributes (D_x) and (D_y) is used to partition the data into a small number of partitions [pg. 258-259 §4.1].

b) ***constructing a set of pixel blocks that represent the values such that the pixel blocks are visually distinguished by the visual boundary,***

   i. ***each pixel block having a set of pixels,***

   ii. ***each pixel having a pixel value that visually represents one of the values of the variable.***

Fig. 6 shows the general idea of pixel bar charts with the dividing attributes (D_x) and (D_y). Furthermore, each data item is represented by a single pixel in the bar chart [pg. 257 §3.1]. Therefore, each pixel within each pixel block shown in Fig. 6 represents a value.

In regards to claim **2**, Keim teaches allowing the user to select a bar of a pixel bar chart to get the bar expanded and the corresponding data partitioned according to the next level of the hierarchy [pg. 258 §3.3].

In regards to claim **8**, Keim teaches specifying dividing attribute hierarchy for hierarchical partitioning of dividing attribute. The hierarchy is a grouping of categorical values or numerical value ranges from bottom to top of the hierarchy [pg. 258 §4.1].

In regards to claim **11**, Keim teaches specifying a color attributes for pixel coloring [pg. 258 §4.1].

In regards to claim **13**, claim 13 recites the same limitations as claim 1. Therefore, the same rationale used for claim 1 is applied. Furthermore, Keim teaches storing data on memory [pg. 262 §5.1]. Although Keim fails to explicitly teach a display and graphics processor, it would have been obvious to one of ordinary skill in the art that the pixel bar chart is displayed on display to the user that would be connected to a computer that comprises a processor to generate the pixel bar charts as taught by Keim.

In regards to claim **14**, claim 14 recites the same limitations as claims 2 and 13. Therefore, the same rationale used for claims 2 and 13 is applied.

In regards to claim **15**, claim 15 recites the same limitations as claims 8 and 13. Therefore, the same rationale used for claims 8 and 13 is applied.

In regards to claim **18**, claim 18 recites the same limitations as claims 11 and 13. Therefore, the same rationale used for claims 11 and 13 are applied.

In regards to claim **20**, claim 20 recites the same limitations as claim 1. Therefore, the same rationale used for claim 1 is applied. Furthermore, Keim teaches the method is carried out via HTML and Java applets over a server [pg. 262 §5].

In regards to claim **21**, claim 21 recites the same limitations as claims 2 and 20. Therefore, the same rationale used for claims 2 and 20 is applied.

In regards to claim **22**, claim 22 recites the same limitations as claims 8 and 20. Therefore, the same rationale used for claims 8 and 20 is applied.

In regards to claim **24**, claim 24 recites the same limitations as claims 11 and 20. Therefore, the same rationale used for claims 11 and 20 are applied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims **3-5**, **9**, **10**, **12**, **16**, **17**, **19**, **23** and **25** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Hierarchical Pixel Bar Charts" to Keim et al.

Keim teaches the limitations of claims 3 and 4 with the exception of explicitly teaching determining a location for a line and area. However, in regards to claim **3**, Keim implicitly teaches *determining a visual boundary comprising determining a location for a line in the pixel-oriented graph in response to the aggregate.* The method of Keim specifies a dividing attribute for between-bar partitioning, by allowing more than one dividing attribute, i.e., one for the horizontal axis (D_x) and the one for the vertical axis (D_y). This implicitly defines a border (i.e. a line) to divides the data into sections (i.e. aggregates) [pg. 258-259 §4.1].

In regards to claims **4** and **5**, Keim implicitly teaches *determining a visual boundary comprising determining a location for an area in the pixel-oriented graph in response to the aggregate.* With the same rationale as applied to claim 3, the dividing attributes (D_y and D_x) partition the data and thus, as shown in Fig. 6, define areas of data [pg. 258-259 §4.1]. Furthermore, can be seen in Fig. 6, the defined areas are rectangles.

Keim teaches the limitations of claim **9**, with the exception of explicitly teaching replicating one or more pixels in the pixel block. However, in regards to claim **9**, Keim teaches that specific requirements for pixel displays are dense display, i.e., bars are filled completely [pg. 259 §4.2]. The dense display constraint requires that all pixel rows (columns) except the last one be completely filled with pixels [pg. 260 §4.2.1]. Therefore, it would have been obvious to one of ordinary skill in the art that in order to fulfill this constraint, replication of pixels.

In regards to claim **16**, claim 16 recites the same limitations as claims 9 and 13. Therefore, the same rationale used for claims 9 and 13 is applied.

In regards to claim **23**, claim 23 recites the same limitations as claims 9 and 20. Therefore, the same rationale used for claims 9 and 20 is applied.

Keim teaches the limitations of claim **10** with the exception of explicitly disclosing a user selection of the visual boundary. However, Keim teaches specifying a dividing attribute

for between-bar partitioning. Dividing attribute partitions the data into disjoint groups corresponding to the bars. Dividing attribute, i.e., one for the horizontal axis (D_x) and the one for the vertical axis (D_y). The dividing attributes (D_x) and (D_y) is used to partition the data into a small number of partitions [pg. 258-259 §4.1]. Furthermore, the system/method of Keim uses a web browser to allow real-time interaction to explore relationships and retrieve data within a region of interest. The user at the client side visually explores the data by dynamically accessing the data through the browser [pg. 262 §5]. Therefore, although not explicitly taught, it is implicit that the user can specify such boundaries via the web browser of Keim.

In regards to claim **17**, claim 17 recites the same limitations as claims 10 and 13. Therefore, the same rationale used for claims 10 and 13 is applied.

Keim teaches the limitations of claim **12** with the exception of explicitly disclosing applying a weight to the visual boundary. However, Keim teaches specifying coloring attributes. Different attributes may be assigned to colors in charts to relate the different coloring attributes and detect partial relationships among them [pg. 258-259 §4.1]. Therefore, it would have been obvious to one of ordinary skill in the art that specifying the coloring around the visual boundary provides an indication to the user of the attribute of association.

In regards to claim **19**, claim 19 recites the same limitations as claims 12 and 13. Therefore, the same rationale used for claims 12 and 13 are applied.

In regards to claim **25**, claim 25 recites the same limitations as claims 12 and 20. Therefore, the same rationale used for claims 12 and 20 are applied.

3. Claims **6** and **7** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Hierarchical Pixel Bar Charts" to Keim et al. in view of "Designing Pixel-Oriented Visualization Techniques: Theory and Applications" to Keim.

"Hierarchical Pixel Bar Charts" to Keim et al. (further referred to as "Charts") teaches the limitations of claims 6 and 7 except disclosing location for a circle or curve. However, "Designing Pixel-Oriented Visualization Techniques" to Keim (further referred to as "Techniques") teaches applying different visualizations of pixel-oriented visualizations.

In regards to claims **6** and **7**, claims **6** and **7** recites the same limitations as claim 1. Therefore, the same rationale used for claim 1 is applied. Additionally, "Techniques" teaches the circle segments technique where the visualization technique is to display the data dimensions as segments of a circle [Fig. 13, pg. 67 §5]. The circle technique inherently applies to a curve, as limited in claim 7.

It would have been to one of ordinary skill in the art to apply the visualization techniques of "Techniques" to the bar charts of "Charts" because the circle segments

technique provides a better optimization, especially for larger dimensionalities and the whole data set is better perceivable ["Techniques" pg. 67 §5].

(10) Response to Argument

Appellant argues Keim et al. ("Hierarchical Pixel Bar Charts") fails to teach or suggest a visual boundary for representing an aggregate of a set of values of a variable depicted in a pixel-oriented graph. Examiner respectfully disagrees. With reference to Fig. 12 of Keim [pg. 265], the attributes used for partitioning (D_x, D_y) can be selected and changed at executing time. Keim further teaches to show aggregated values, pixel bar charts can employ average/median lines. The average/median line separates a bar into two parts. The upper part of the data exceeds the average/median value. The lower part of the data is below the average/median value. With a line divider, the user can easily identify the difference in data distribution between the two portions [pg. 264 §5.5]. Thus, Keim teaches a visual boundary for representing an aggregate of a set of values in a pixel-oriented graph.

Appellant argues Keim fails to teach or suggest filling in one or more gaps in the pixel blocks by replicating one or more pixels in the pixel blocks. Examiner respectfully disagrees. Keim teaches that specific requirements for pixel displays are dense display, i.e., bars are filled completely [pg. 259 §4.2]. As Appellant argues, the dense display constraint requires that all pixel rows (columns) except the last one be completely filled with pixels [pg. 260 §4.2.1]. However, the claim recites the limitation "one *or* more gaps". Thus, although the requirement of the dense display is that all the pixel rows are

filled except for the last pixel row, at least one of the gaps, i.e. the entire bar except one pixel row, is filled completely.

Appellant argues Keim fails to teach or suggest applying a weight to the visual boundary that indicates a relative importance of the aggregate. Examiner respectfully disagrees. Keim teaches specifying coloring attributes. Different attributes may be assigned to colors in charts to relate the different coloring attributes and detect partial relationships among them [pg. 258-259 §4.1]. Therefore, it would have been obvious to one of ordinary skill in the art that specifying the coloring around the visual boundary provides an indication to the user of the attribute of association.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Michelle K. Lay

08.27.2007

Conferees:

Kee Tung

Richard Hjerpe

KEE M. TUNG
SUPERVISORY PATENT EXAMINER